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SCHUYLKILL RIVER BASIN POST HURRICANE AGNES FLOOD DAMAGE SURVEY--ETC(U)

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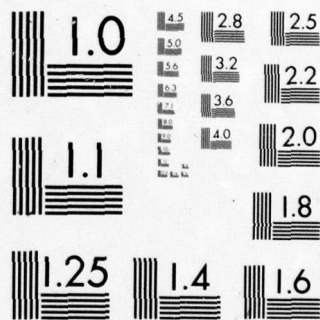
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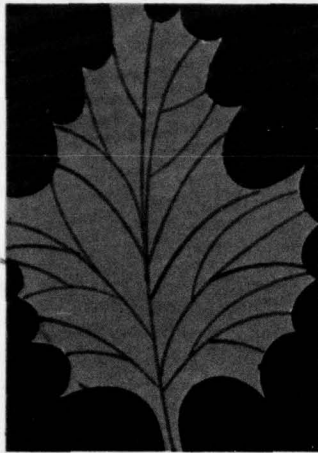


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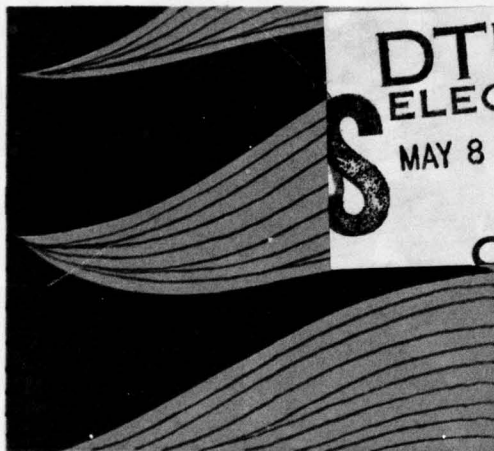
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GILBERT ASSOCIATES, INC. engineers, planners, consultants

FINAL REPORT
SCHUYLKILL RIVER BASIN
POST HURRICANE AGNES
FLOOD DAMAGE SURVEY
U.S. ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

DECEMBER 1972



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GILBERT ASSOCIATES, INC.

ENGINEERS AND CONSULTANTS

P.O. BOX 1498 / READING, PA. 19603

January 4, 1973

Department of the Army
Philadelphia District, Corps of Engineers
Custom House
Second and Chestnut Streets
Philadelphia, Pennsylvania 19106

Attention: Mr. Salvatore Bucolo
Project Engineer

Re: Post Flood Damage Survey
Schuylkill River Basin
6757-00

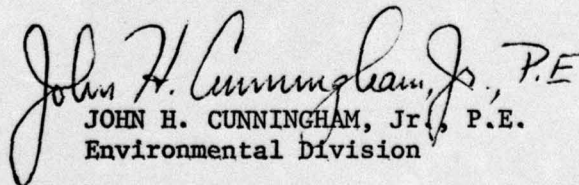
Gentlemen;

Reference is made to our Final Report on the subject named project.

We have just learned that two persons were drowned here in Berks County due to flooding from Hurricane Agnes. These deaths occurred in Upper Tulpehocken Township.

We also wish to point out that the second word in the second sentence on page 11, should be "wreak" not "wreck". This will make the sentence more meaningful.

Very truly yours,


JOHN H. CUNNINGHAM, Jr., P.E.
Environmental Division

JHC:pkh

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
Hurricane Agnes Flood control Floods Schuylkill River Basin Flood damages		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
Hurricane Agnes and the resulting rains struck eastern Pennsylvania on June 23, 1972 causing extensive flooding. In August 1972, the U.S. Army Corps of Engineers, Philadelphia District contacted a consulting engineering firm for a post flood damage study of the entire Schuylkill River Basin in southeastern Pennsylvania. Data was collected from various municipal authorities and experts in the fields of railroads, highways, and utilities.		

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GILBERT ASSOCIATES, INC.

ENGINEERS AND CONSULTANTS

P.O. BOX 1498 / READING, PA. 19603

December 26, 1972

Department of the Army
Philadelphia District, Corps of Engineers
Custom House
Second and Chestnut Streets
Philadelphia, Pennsylvania 19106

Attention: Mr. Salvatore Bucolo
Project Engineer

Re: Final Report of Post Flood Damage
Survey for Schuylkill River Basin
GAI W. O. No. 066757-000
Your Contract No. DACW61-73-C-0231

Gentlemen:

Gilbert Associates, Inc. is pleased to present to the Army Corps of Engineers the final report for the subject named project. The following report describes the method of preparation through to compilation of total damage figures.

The report will develop tangible and intangible figures for the entire basin. In addition, as described in the report, it is felt that a factor of from 10 to 25 percent should be added to the total figure to cover unknowns. The following Basin-wide figures have been developed (see pages 9 through 11 in the report):

Total Basin-wide Tangible Damages	\$141,285,637
Total Basin-wide Intangible Damages	<u>7,309,700</u>
Total Basin-wide Tangible and Intangible Damages	\$148,595,337
Total Basin-wide Tangible and Intangible Damages x 110% =	\$163,454,871
Total Basin-wide Tangible and Intangible Damages x 125% =	\$185,744,171

Thus, the total damages for the entire Basin can be said to approach \$200,000,000. One flood attributable death was reported in the Basin.

We wish to express our appreciation to the Corps of Engineers and to Messrs. Bucolo, Enson, and Stockman. We greatly appreciate their guidance and assistance on this project.

Very truly yours,

John H. Cunningham, Jr., P.E.
John H. Cunningham, Jr., P.E.
Project Manager
Environmental Division

JHC:vml

INDEX

	<u>Page</u>
<u>INTRODUCTION</u>	1
<u>COMMENCING THE SURVEY</u>	1
<u>COLLATING THE DATA</u>	2
Municipal Expenses	2
Other (County, State, Federal) Governmental Expenses	3
Highway/Railroad/Utilities Expenses	3
Residential Expenses	4
Commercial/Industrial Expenses	5
School Expenses	5
Agricultural Expenses	5
<u>EMERGENCY COSTS</u>	6
Commonwealth of Pennsylvania	6
U. S. Federal Government	7
Charitable Organizations	8
Assignment of Emergency Costs	8
<u>FINDINGS OF TANGIBLE DAMAGES</u>	9
<u>INTANGIBLE EXPENSES</u>	10
<u>DAMAGE TOTALS</u>	11
<u>DISCUSSIONS</u>	11

Appendices:

Compilation Sheets
Intangible Damages - Computations
Schuylkill River Reaches

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US ARMY CORPS OF ENGINEERS
PHILADELPHIA DISTRICT

POST FLOOD DAMAGE SURVEY
HURRICANE AGNES - JUNE 1972
SCHUYLKILL RIVER BASIN

INTRODUCTION

Hurricane Agnes and the resultant flooding struck eastern Pennsylvania on June 22-23, 1972, producing one of the worst natural catastrophes in the history of the United States. Damages were caused by over-the-banks flooding throughout Pennsylvania and the eastern United States.

In August 1972, the US Army Corps of Engineers contacted the consulting firm of Gilbert Associates, Inc. and a contract was negotiated for the performance of a post flood damage study of the entire Schuylkill River Basin encompassing approximately 1900 square miles in southeastern Pennsylvania. Field work began at the end of August. The damage survey forms, completed by the field crews, have been delivered to the Philadelphia District Office in a separate submission.

In line with the Scope of Work, the areas of Schuylkill Haven, Birdsboro, Pottstown and South Pottstown (South Coventry Township), and the Stony Creek area of Norristown were surveyed first.

COMMENCING THE SURVEY

In order to determine the extent of the affected area, municipal officials, primarily in the upland areas where little if any damages could have occurred, were contacted by phone. Areas that were obviously affected were not contacted initially by telephone. The various officials were asked if the municipality, itself, incurred any damages or expenses and if they knew of any commercial, industrial, or residential damages within the municipality. Municipalities responding "no" to both questions were removed from the list of areas requiring field checking. Also eliminated from field checking were municipalities with no commercial, industrial, or residential damages and only minimal municipal expenses.

In order to determine municipal expenses, contact was made with the Office of Emergency Preparedness (O.E.P.) whose area office was established at the Hamburg State Hospital. In addition to the figures shown on the O.E.P. applications municipal officials were asked to furnish us with all other flood related expenses. This is discussed further in the section on "Municipal Expenses. County officials were contacted by phone to determine the extent of their damages. Those with no damage were ruled out in this manner. This telephone canvassing pin-pointed the areas requiring field visits.

Prior to the start of field work, residential appraisal unit prices were prepared to assist the field crews in estimating repair and/or replacement costs to structures and their contents. Similar data was prepared for commercial entities (average stock contents, furnishings, etc.). County breakdown sheets were also prepared which listed all political subdivisions within each county that were totally within or partially (marked with an asterisk) within the Schuylkill River Basin.

Concurrently experts in the fields of railroads, highways, and utilities were preparing their activities. Contact was made with the various Pennsylvania Department of Transportation offices to accumulate their damage expenses. Only three railroads that serve the Basin were found to have suffered damages. Arrangements were made to examine items of major damage (if any) and to accumulate costs.

The Pennsylvania Public Utility Commission provided data on electric, gas, and telephone utilities operating within the Basin and arrangements were made to obtain these damage costs. A list of non-municipally owned water systems within the Basin was also provided by P.U.C. and these utilities were also to be contacted.

In order to facilitate breaking down the River, reaches were established and designated by Roman numerals. Fifteen reaches were established and are listed in the appendix.

COLLATING THE DATA

As data was accumulated, it was reviewed and separated by political subdivision. The data was divided into: Municipal Expenses; Other (County, State, Federal) Governmental Expenses; Highway/Railroad/Utility Expenses; Residential Expenses; Commercial/Industrial Expenses; School Expenses; Agricultural Expenses; and Emergency Costs. These are the headings for each column on the county compilation sheets.

Separate breakdown sheets were used to further segregate the totals for some of the columns listed above. Similarly, breakdown sheets for each county, broken down by municipality, were prepared for Municipal Expenses; other (County, State, Federal) Expenses; and Highway/Railroad/Utility Expenses.

The following describes our treatment or handling of each of the various headings on the county compilation sheets.

Municipal Expenses

The first seven columns on the breakdown sheets represent municipal damages and expenses. These figures were taken from the O.E.P. applications of the various municipalities and additional expenses were included where applicable.

Two examples of additional expenses are: 1) municipalities are not allowed to apply to O.E.P. for reimbursement for damages to recreational facilities and 2) one township had an old bridge washed out - the "replacement-in-kind" value

(that which is allowable by O.E.P.) of the bridge is only one third of the construction costs that will be incurred in order to rebuild this bridge satisfying current Pennsylvania Department of Transportation and Department of Environmental Resources (for stream encroachment) parameters. Three-page forms were completed for municipal buildings (Borough Hall, Municipal Garage, etc.) directly affected by flooding.

Under the sixth column, "Utilities (Municipal)", the figures furnished by the municipality are shown. For a given municipality, this may exceed the amount shown on their O.E.P. application for one reason or another. It should be noted that many municipalities had sewer line and water line damages. These are not shown on a three-page form and are not graphed. Hence, where the summation of the utility damages on the three-page forms (for sewage pumping stations, sewage treatment or water treatment plants, etc.) does not equal the amount shown in column six, the difference is due to un-graphable, miscellaneous damages, for which three-page forms were not completed.

Column eight, "Other", lists (in almost every case) only the volunteer expenses incurred by Fire Companies, Special Police, etc. These figures cover both manhours expended (at an hourly charge) and all expenses incurred in the providing of volunteer services.

For each municipality, the total for all eight columns on the breakdown sheet is shown on the county compilation sheets.

Other (County, State, Federal) Governmental Expenses

Various contacts were made with State and Federal agencies. Expenses (other than damage figures) and damages were incurred by State Parks, State Game Lands, the Valley Forge Army Hospital, etc. These figures are shown for that municipality in which the affected facility is located. A separate group of breakdown sheets detail these expenses.

County governments were individually contacted and data obtained on the same basis as with the individual municipalities. Again, O.E.P. applications were checked and additional expenses were included. County damages, where known, were assigned to the municipality affected. The remaining county damages were apportioned over the affected areas.

The totals shown for "Other Governmental Expenses" on the compilation forms are a summation of the State, Federal and apportioned County figures.

Highway/Railroad/Utilities Expenses

Column one on these forms lists the highway damage figures received from the Pennsylvania Department of Transportation for their roads (exclusive of county or municipal roads). It should be noted that if there were expenses unassigned by location (such as barricade or flasher rental expenses), these figures were apportioned over the county's entire road damages.

Columns two and three detail the railroad damages (by location) as given by the respective railroads. In the case of the Penn Central and of the Reading Company, extensive car and lading damages were realized. These damages were not broken down by location. Hence, these additional amounts have been apportioned over the areas where damages actually occurred. In the case of the Reading Company, total facility damages in the Basin were about \$319,650, while the un-allocatable car damages exceeded \$84,000 and the un-allocatable lading damages were \$369,000. In the case of the Penn Central, un-allocatable car damages were provided, county by county, and these additional expenses were apportioned over those municipalities within the County having railroad damages. The B&O Railroad, which only had expenses in Philadelphia, was the only other railroad within the Basin to report damages. The above numbers were taken from figures submitted by the railroads to the Federal Railroad Administration.

Column four lists damages incurred by Metropolitan Edison and Philadelphia Electric. Pennsylvania Power and Light, serving the upper part of the Basin, reported no assignable flood damages within the Schuylkill River Basin. The two affected electric utilities reported damages to directly affected facilities, plus unassignable distribution system facility expenses, cost of purchased power (in the case of affected generating facilities), and estimated profit on lost sales. These latter three items have been apportioned by municipality over the service area that was affected by flooding.

Column five lists damages incurred by Bell Telephone Company, Conestoga Telephone & Telegraph Company, and Leesport Rural Telephone Company. No assignable flood damages were reported by the Bethel & Mt. Aetna Telephone & Telegraph Company or by the Quaker State Telephone Company. As with the electrical utilities, the expenses incurred at directly affected facilities were assigned to the applicable municipality. Unassignable costs were apportioned by municipality over the service area that was affected by flooding.

Gas utility expenses were applied directly to the municipality in which they occurred. These expenses were minimal and affected only four municipalities.

Commercial/Industrial type forms were prepared for the various damaged facilities by location, for telephone, gas, and electric companies. In the case of telephone and electric damage figures as broken down by municipality, the total damages reported on the forms may be less than the amount shown for that municipality. The additional amount will be the apportioned amount of the unassigned expenses.

Residential Expenses

Random sampling methods were used in selecting sample houses. A five-page damage form was prepared and a damage graph drawn for each sample. Summary sheets relate other affected houses to the sample house. In arriving at total damages to the houses on the summary sheets, the high water elevation at each affected house was used and a percentage of damage obtained from the graph of the damages to the sample house.

It should be noted that in isolated cases, it was necessary to utilize a sample house for homes located in adjoining municipalities.

Commercial/Industrial Expenses

All affected businesses were visited, three-page damage forms completed, and graphs prepared. In isolated cases, a summary sheet was prepared to show equivalent damages to similar establishments. In each of these cases the flood level was basically the same as at the sampled business and therefore the total damages were assumed to be the same.

School Expenses

Contact was made initially with each county's Superintendent of Schools. These offices had records of those districts within the county which were affected by Hurricane Agnes. Contact was then made directly with the affected districts to obtain school expenses incurred, whether damages occurred due to flooding or where buildings were used as temporary shelter for victims.

Agricultural Expenses

A review with various U. S. Department of Agriculture agencies (Farmers Home Administration, Agricultural Stabilization and Conservation Service, Soil Conservation Service) indicated that only ASCS had meaningful data on the flood. The Federal Government had an established program called REAP (Rural Environmental Assistance Program). As a result of the flood, the USDA established a "sub-program" under REAP called Emergency Conservation Measures whereby affected farmers could make application for and, if approved, receive a grant of 80% of the damage incurred. This is the only manner in which any state or federal agency could give us an approximation of the damages incurred to agriculture.

To date, applications have been received only for the following affected counties in these approximate amounts:

	<u>Applied for</u>	<u>Total Damages</u>
Berks	\$58,000	\$72,500*
Chester	40,000	50,000
Lebanon	2,400	3,000
Lehigh	1,600	2,000
Montgomery	6,000	7,500
Schuylkill	12,672	15,840

* An additional estimated \$50,000 of damages occurred due to erosion at one farm.

The figures shown above have been apportioned within the respective counties, based upon where damages occurred. Note that some additional farm losses were incurred by the State Game Commission and by Graterford Prison. These are shown separately on the "Other Governmental Expenses" breakdown sheets.

EMERGENCY COSTS

The most difficult information to obtain was the emergency expenses incurred by various state, federal, and charitable agencies. To obtain this data, telephone contact was made with their various headquarters in Harrisburg, Philadelphia, and Washington. These emergency costs are described below.

Commonwealth of Pennsylvania

1. The Pennsylvania Turnpike Commission, Fish Commission, and Department of Property and Supplies reported no known expenses or damages in the Schuylkill River Basin. The Pennsylvania Game Commission, and Parks Department plus Pennhurst School expenses are listed on the "Other Governmental Expenses" breakdown sheets, under the municipality where they occurred. The Pennsylvania Liquor Control Board expenses are listed according to store locations on Industrial/Commerical forms. Pennsylvania Department of Transportation expenses are shown on the Highway/Railroad/Utilities breakdown sheets.
2. The Pennsylvania National Guard damages at the Armory in Philadelphia are shown on an Industrial/Commerical Form. National Guard emergency expenses during the disaster (active duty training for some units) were estimated by the Guard's Administrative Officer to be \$90,000 in the Schuylkill River Basin.
3. The Pennsylvania State Police incurred additional expenses due to the flood, including minor equipment damages. The Fiscal Officer estimated that the total expenses incurred in the Schuylkill River Basin were \$255,000 (15% of the total statewide expenditures).
4. The Pennsylvania Department of Environmental Resources has had and will continue to have large expenditures. Repairs to flood control facilities, desilting programs, mine subsidence, and other activities, all the result of Hurricane Agnes, have and will be made. Activities of the Health Department are also involved. Statewide expenditures (including administrative expenses) are estimated to ultimately reach \$20,000,000. Of this total, only \$3,000,000 is expected to be spent in the Schuylkill River Basin.
5. The Pennsylvania Department of Labor and Industry's Bureau of Employment Security has aided affected areas. Federal training funds were diverted by the U.S. Government for flood relief. The SPEED (Special Program for Emergency Employment Development) Program was set up to pay volunteers for services provided. The following funds were allotted, by county:

Berks	\$ 96,000
Montgomery	64,000
Schuylkill	<u>28,000</u>
Total	\$188,000

Although some of these funds may not yet have been spent, it is assumed that they will be.

It is felt that other state departments, not listed above, have been involved in the total flood disaster. Governor Shapp, along with many other State Officials, has spent time on the project, although mostly involving the disaster in the Susquehanna River Basin. For this reason we have arbitrarily added an additional \$353,000 for other miscellaneous State incurred emergency costs (10% of the above itemized \$3.53 millions). This will bring the state emergency expenses to a total of \$3,886,000 for the Schuylkill River Basin.

U. S. Federal Government

1. The Environmental Protection Agency has been involved primarily in cleaning up the oil spill from Berks Associates, Union Township, Berks County. Oil damage compounded the losses to home and business owners, in addition to its effect on flora and fauna. EPA has estimated that it will spend \$5,050,000 on oil clean up and other services in the Schuylkill River Basin.
2. The Office of Emergency Preparedness, so far, has handled applications for about \$121,000,000 in reimbursable damages to state, county, and local governments within Pennsylvania. It is felt that the total statewide expenditures by O.E.P. will ultimately reach \$200,000,000. This estimate was given by the State Director. By law, O.E.P. can incur administrative expenses not-to-exceed 3 percent of the total monies expended and it is felt that actual expenditures are right around this 3 percent figure. Hence, on a statewide basis, a total of \$6,000,000 would be expended. Of this total, it is again estimated that approximately 15% will be attributable to the Schuylkill River Basin, for a total expense of \$900,000.
3. The U. S. Army Corps of Engineers has undertaken extensive repair, replacement, clean-up, etc., activities in the Basin. As a result, to date, the Comptroller for the Philadelphia District reports that contracts for a total of about \$4,400,000 have been awarded or negotiated. It is anticipated that this total will ultimately reach \$6,500,000 before all flood related work has been completed.
4. The U. S. military establishment provided some direct assistance during the emergency. This was limited primarily to helicopter operations in rescue activities. An estimate of \$3,000 in services has been made.
5. The Federal Highway and Railroad Administrations were minimally involved in their respective fields in flood related activities. The total expenses for both agencies amount to only about \$50,000.
6. The General Services Administration's Pennsylvania regional office (in Philadelphia) has provided a figure of \$1,687,744 for emergency expenses which they have incurred in the Schuylkill River Basin.
7. The Regional Office in Philadelphia of the Department of Housing and Urban Development has provided a figure of \$8,580,000 for the past and future emergency expenses incurred by them in the Basin due to damages from Hurricane Agnes.

8. The Small Business Administration has provided a figure of almost \$16,000,000 in expenditures (excluding loan amounts) within Pennsylvania. This figure was provided by their Disaster Operations Chief in Washington. As in other instances, a figure of 15% was assigned to the Schuylkill River Basin and an amount of \$2,381,456 computed for the entire Basin.

The major amounts of emergency costs were incurred by federal agencies (approximately \$25,000,000). It is felt that these numbers comprise the major expenses incurred by the federal government and, as a result, there is anticipated to be little miscellaneous or additional expenditures. For this reason we are arbitrarily adding an additional sum of \$250,000 (about 1% of the itemized figures above). This will raise the federal emergency expenses to a total of \$25,402,200 for the entire Basin.

Charitable Organizations

Both the Red Cross and the Salvation Army provided relief services within the state. It has been impossible to segregate those expenses which were incurred in the Schuylkill River Basin alone. An estimate has been made to include volunteer and professional personnel services as well as contributed goods and supplies. The estimates, based on information supplied by both organizations, are: Red Cross - \$400,000; and Salvation Army - \$250,000.

Many churches and church related organizations provided food and supplies while parishioners provided volunteer labor. It is impossible to determine where and how much these services amounted to. For this reason an arbitrary 10 percent has been added to bring the Charitable Organizations total to \$715,000.

Assignment of Emergency Costs

With the totalization of all Emergency Costs, excluding those expenses assignable to specific areas (military helicopter and Bureau of Employment Security expenses), it was necessary to first apportion the total of \$29,812,200 to the various counties and then apportion the county expenses to each individual municipality.

It was felt that sufficient information was available (all other expense and damage figures) to allow apportionment of these Emergency Costs on this basis. As an example, of the total basin expenses (excluding the Emergency Costs) of about \$111,281,000 a figure of about \$40,066,000 occurred in Berks County or 36% of the Basin Total. Hence Berks County was apportioned \$10,733,800 of the unassigned Emergency Costs.

Each county's assigned and apportioned Emergency Costs were first totaled, then a similar apportionment was made to the municipalities within the County. In this way, an Emergency Cost was assigned to each municipality within the entire Basin. This process was discussed fully before being performed and it was felt that such a procedure was more proper than making a strictly arbitrary apportionment.

FINDINGS OF TANGIBLE DAMAGES

The total Schuylkill River Basin tangible flood damage figures by County are shown on the compilation sheets in the Appendix and are as follows:

Berks County	\$ 50,897,165
Bucks County	9,320
Carbon County	0
Chester County	16,590,717
Delaware County	0
Lebanon County	128,065
Lehigh County	152,293
Montgomery County	57,709,888
Philadelphia City/County	8,564,779
Schuylkill County	7,233,410
Total Basin	<u>\$141,285,637</u>

It should be noted that on the compilation sheets, below some of the municipalities, streams and/or rivers are listed. Opposite these streams are the various damage figures which can be attributed directly to these streams. Opposite the municipality's name are the various total figures for that municipality.

However, there are additional tangible expenses that are not and can not be defined or included. These additional expenses include (but are not limited to):

1. Interest paid by the borrower on home improvement and SBA loans,
2. Interest and principal, lost by mortgagors due to people not making their monthly mortgage payments during the emergency,
3. Most of the field work was performed during September and October 1972 while the weather was still warm. After the heating season began, reports have been heard that considerable damages were becoming apparent as furniture and buildings more completely dried out. Also, many affected heating systems, thought to have been repaired, did not function properly in full-time use. As a result, additional expenses have been incurred that had not been included on the damage forms when the buildings were surveyed.
4. Additional un-anticipated or unknown damages are continually appearing, which were not included in our damage figures. In reviewing the 1971 flood damages along Stony Creek, Norristown, it was discovered in numerous cases that the actual damage expenses which are now reported, more than a year after the flood, differed greatly from the figures given to Corps personnel shortly after that disaster.

5. Many state and federal programs will occur as an after effect of this disaster. Flood control facilities, redevelopment programs, etc. will be undertaken as a direct result, and these expenses can be tied directly to the flood. It may never be known how many of these expenses were directly or indirectly relatable to this disaster.

For the above and other reasons, it is felt that, for the purpose of more closely approximating the total damage figures, a multiplier should be applied to all generated figures. This multiplier could be anywhere from 1.10 to 1.25 or even higher. It is possible that on similar evaluations on other disasters, a multiplier has been developed by the Federal Government to cover these unknowns, and this figure could be utilized.

INTANGIBLE EXPENSES

Loss of human life in the Basin was limited to one person, a Philadelphia policeman who drowned while making a rescue attempt in the Manayunk area of that City.

In Reading, Pottstown, and Norristown, the water and sewerage systems were both disabled. Water usage was curtailed (drastically in Reading) and this created an additional flood-related cost. Industrial and some commercial activities were curtailed (or even halted completely). Estimates have been made for these three cities, as shown on attached sheets. These estimates in the case of Norristown and Reading are based upon occupational head tax figures provided by the municipalities. In the case of Pottstown, industrial water rates are based on the number of employees. Hence, the Borough was able to report the number of employees affected at the ordered shutdown of specific industries in specific locations.

For these three areas, the intangible damages are estimated at:

Reading	\$4,860,000	
Norristown	1,195,200	
Pottstown Area:		
Pottstown	1,120,000	
West Pottsgrove Twp	69,000	
Lower Pottsgrove Twp	65,500	
		\$ 7,309,700

It is realized that companies other than those suffering direct damages were affected by the flood, due to affected truck or railroad service, due to secondary affects (suppliers of parts or services out of business), due to workers' homes being damaged or the workers involved in emergency activities and the employees not being able to report for work, etc. It is not possible to assign an amount to these flood caused affects.

There are other intangibles that cannot be estimated. Inconveniences (temporary or even permanent) due to bridge outages, affected phone or utility services, closed commercial establishments, etc. cannot be guesstimated.

The flood of 1972, although causing large amounts of personal discomfort, did not wreck the physical havoc that similar floods have caused. There appears to have been no damages to historic, scenic, or archaeologic resources in any areas of the Basin. Damages to recreational and conservational resources were minimal and repairable.

DAMAGE TOTALS

Summing the total tangible and in-tangible damages for the Basin, a figure of \$148,595,337 is obtained. This is the total without adding any additional amount for unknowns as discussed in the second paragraph on page 10.

Were this total figure used with a multiplier of 110 and 125 percent, the total Basin damage figure would be \$163,454,871 and \$185,744,171, respectively. From this, it can be assumed that the total damages and expenses incurred in the entire Schuylkill River Basin approaches \$200,000,000.

DISCUSSIONS

Many thoughts are generated during and at the completion of a project of this nature - some constructive suggestions, some informative comments:

1. Field crews received many complaints of the following nature: "This is the sixth group to visit our facility - what is the matter with the Federal Government; doesn't the left hand know what the right hand is doing - we are trying to get back to some semblance of normality and we have to spend so much time answering questions and filling out forms." We acknowledge that many groups are attempting to accumulate different data for differing purposes. It is hoped that for future disasters a compilation of needs could be made so that only one or two groups would have to visit an affected establishment to obtain all needed data, make appraisals, determine flood levels/zero damage elevations, etc.
2. A report was erroneously circulated in the Spring City area (and probably in other locations), prior to the crest's arrival, that a dam had broken near Reading and that a five foot wall of water was coming down river. As a result, efforts to move items to higher locations were abandoned and the low lying areas evacuated. Due to this report many thousands of dollars of losses were incurred that could have been saved with the operation of a better or more accurate emergency network.
3. In the Scope of Work for this project, it is stressed that we are to obtain costs of "damages" incurred. It is, however, the requirement of this project to determine ALL expenses and costs incurred, whether due to damages or due to other reasons. For example, a uniform rental firm had minimal physical damages, and zero lost wages, but the cost of having to transport soiled uniforms to distant locations and the added laundering expenses at these distant commercial laundries prompted the company's manager to say that it was costing him two to three dollars for every dollar received; and yet he felt that he was obligated to continue to serve his customers rather than take the chance of losing them.

For this reason, from a psychological standpoint, the emphasis on future damage surveys should be on obtaining dollar figures for "costs and expenses" incurred as opposed to "damages". One expression used to key the thinking of the interviewed party was, "What expenses did you incur as a result of Hurricane Agnes that you would not have incurred had there not been flooding." This immediately allows the interviewee to think of all expenses, not only the physical damages.

4. The full extent of damages and areas affected are unknown when negotiating for a project of this nature. The man-hours allotted by the Corps were not, in the case of this project, sufficient to provide the coverage and accuracy that we, as consultants, feel should have been performed. Much reliance was made on telephone contact with, in particular, municipal officials. A very small percentage of boroughs and townships have staffed offices and reaching these officials became a major problem. Fortunately, in most cases, these officials accepted the request for information, as presented over the telephone, and were very candid in furnishing the data.

For the most part, the people contacted at residential, commercial, and industrial establishments were quite amenable and willing to provide us with the data requested. In some cases, people were reluctant to assist the field crews. The latter made it necessary to spend considerable effort following up in person or by telephone. It is felt that it is impossible to properly negotiate similar future lump sum contracts without having more knowledge of the extent of damage. Such contracts cause problems to the consultant in attempting to do a proper project within the constrictions placed by the Corps wherein neither party fully realizes the extent of services required at the time of negotiations.

5. As can be expected, with excessive rainfall, flooding (unrelated to over-the-banks flooding) can occur due to storm drainage systems being inadequate or unavailable to carry off the water. Some areas are known to suffer from this problem, even with a moderate rainfall and these were ignored by our field crews.

Drainage problems were encountered in the following areas, based on information turned in by the field crews:

1. Bechtelsville, Berks County
2. Laureldale, Berks County
3. Stony Creek Mills, Lower Alsace Twp., Berks County
4. Temple, Berks County
5. Jackson Twp., Lebanon County
6. Myerstown, Lebanon County (due to constriction at bridges over the Tulpehocken Creek)
7. Port Providence, Upper Providence Twp., Montgomery County
8. Tamaqua, Schuylkill County

This does not include all areas affected by surface drainage problems but only those referred to by field crews.

J.H.C., Jr.
F.M.L.
December 1972

A P P E N D I C E S

BERKS COUNTY COMPILATION SHEET

MUNICIPALITY WITH STREAMS	MUNICIPAL EXPENSES	OTHER GOVTL EXPENSES	HIGHWAY-RR -UTIL EXP.	RESIDENTIAL DAMAGES	COMPL/INDL DAMAGES	SCHOOL EXPENSES	AGRICULTURE DAMAGES	EMERGENCY COSTS	TOTAL
Albany Twp	3,573	195	30,759	-	-	-	-	10,000	44,527
Alsace Twp	16,723	195	10,046	7,530	-	-	2,000	10,000	46,494
Amity Twp	14,828	2,440	99,323	377,545	-	-	3,000	135,000	632,136
Bally Boro	-	-	-	-	-	-	-	-	0
Bechtelsville Boro	9,974	70	2,422	-	1,200	-	-	3,500	17,166
Bern Twp	1,500	2,390	313,347	103,850	-	-	4,000	115,000	540,087
Schuylkill River	-	-	-	24,100	-	-	-	-	-
Tulpehocken Creek	-	-	-	79,750	-	-	-	-	-
Bernville Boro	-	-	-	-	-	-	-	-	0
Birdsboro Boro	115,988	22,735	237,384	558,000	2,724,423	-	-	990,000	4,648,530
Schuylkill River	10,000	-	-	110,000	1,668,600	-	-	-	-
Hay Creek	105,988	-	-	448,000	1,055,823	-	-	-	-
Boyetown Boro	1,500	-	-	-	-	-	-	500	2,000
Brecknock Twp	5,514	-	-	-	-	-	-	1,500	7,014
Caernarvon Twp	-	-	-	-	-	-	-	-	0
Centerport Boro	-	-	-	-	-	-	-	-	0
Centre Twp	6,041	90	10,292	-	-	-	2,000	5,000	23,423
Colebrookdale Twp	21,998	240	6,088	900	13,400	-	2,000	12,000	56,626
West Swamp Creek	-	-	-	-	5,200	-	-	-	-
Ironstone Creek	-	-	-	900	8,200	-	-	-	-
Cumru Twp	37,337	4,620	686,211	-	-	-	-	197,000	925,168
District Twp	3,958	25	1,467	-	-	-	2,000	2,000	9,450
Douglas Twp	9,759	10,110	160,302	726,915	28,400	-	-	253,000	1,188,486
Earl Twp	15,844	3,515	36,648	183,803	100,350	-	4,000	93,000	437,160
Exeter Twp	77,030	3,335	393,382	58,358	56,000	-	2,000	160,000	750,105
Antietam Creek	-	-	-	58,358	17,000	-	-	-	-
Schuylkill River	-	-	-	-	39,000	-	-	-	-
Fleetwood Boro	22,088	125	-	-	-	-	-	6,000	28,213
Greenwich Twp	22,650	510	32,663	-	-	-	2,000	16,000	73,823
Hamburg Boro	33,384	350	1,168	10,550	17,205	-	-	17,000	79,657

MUNICIPALITY WITH STREAMS	MUNICIPAL EXPENSES	OTHER GOVTL EXPENSES	HIGHWAY-RR -UTIL EXP.	RESIDENTIAL DAMAGES	COMM./INDL DAMAGES	SCHOOL EXPENSES	AGRICULTURE DAMAGES	EMERGENCY COSTS	TOTAL
Heidelberg Twp	5,362	-	-	-	-	-	-	1,300	6,662
Hereford Twp	4,500	50	4,872	-	-	-	-	2,400	11,822
Jefferson Twp	-	-	1,400	-	-	-	-	200	1,600
Kenhorst Boro	-	-	-	-	-	-	-	-	0
Kutztown Boro	35,124	4,385	-	104,263	629,321	150	-	210,000	983,243
Laureldale Boro	14,872	1,295	5,000	204,264	1,000	1,500	-	61,500	289,431
Leesport Boro	25,428	895	1,500	27,834	102,244	-	-	42,500	200,401
Lenhartsville Boro	-	-	-	-	-	-	-	-	0
Longswamp Twp	-	-	14,902	-	-	-	-	4,000	18,902
Lower Alsace Twp	280,908	1,675	5,561	-	7,600	-	-	80,000	375,744
Lower Heidelberg Twp	55,621	395	2,693	10,875	-	-	4,000	20,000	93,584
Lyons Boro	-	-	-	-	-	-	-	-	0
Maidencreek Twp	21,600	390	45,441	650	-	-	51,500	32,000	151,581
Marion Twp	-	-	2,091	-	-	-	-	400	2,491
Maxatawny Twp	75,469	940	3,388	85,951	-	-	4,000	46,000	215,748
Mohnton Boro	4,789	-	500	-	-	-	-	1,300	6,589
Mt. Penn Boro	16,500	-	-	-	-	-	-	4,500	21,000
Muhlenberg Twp	209,838	16,950	31,695	784,501	824,730	-	1,000	505,000	2,373,714
Laurel Run	-	-	-	234,888	26,076	-	-	-	-
Schuylkill River	-	-	-	354,318	62,465	-	-	-	-
Bernhart's Creek	-	-	-	195,295	736,189	-	-	-	-
North Heidelberg Twp	8,500	100	1,159	7,250	-	-	2,000	5,000	24,009
Oley Twp	150,957	1,045	26,562	5,450	-	-	8,000	52,000	244,014
Ontelaunee Twp	10,170	5,775	310,813	384,378	308,155	-	4,000	277,000	1,300,291
Maiden Creek	-	-	-	227,630	276,155	-	-	-	-
Schuylkill River	-	-	-	156,748	32,000	-	-	-	-
Penn Twp	1,000	140	2,781	21,750	-	-	2,000	7,500	35,171
Perry Twp	15,500	895	7,772	128,920	4,440	-	3,000	43,000	203,527
Pike Twp	10,000	155	16,980	-	-	-	4,000	8,000	39,135

MUNICIPALITY WITH STREAMS	MUNICIPAL EXPENSES	OTHER GOVTL EXPENSES	HIGHWAY-RR -UTIL EXP.	RESIDENTIAL DAMAGES	COMML/INDL DAMAGES	SCHOOL EXPENSES	AGRICULTURE DAMAGES	EMERGENCY COSTS	TOTAL
Reading City	791,697	142,766	1,027,300	4,155,091	16,946,067	331,133	-	6,323,000	29,717,054
Schuylkill River				4,071,565	13,359,020	278,633*			
Tulpehocken Creek				18,887	62,100	-			
Bernhart's Creek				64,639	3,524,947	17,600			
Wyomissing Creek				-	-	34,900			
Richmond Twp	-	-	16,477	-	-	-	1,000	4,500	21,977
Robeson Boro	20,500	-	-	-	-	-	-	5,500	26,000
Robeson Twp	24,262	9,950	773,182	337,306	526,668	-	3,000	452,000	2,126,368
Schuylkill River				337,306	523,968	-			
Allegheny Creek				-	2,700	-			
Rockland Twp	41,200	445	27,669	-	9,000	-	3,000	22,000	103,314
Ruscombmanor Twp	17,308	30,140	7,980	-	-	-	2,000	15,000	72,428
St. Lawrence Boro	2,484	170	-	1,485	26,521	-	-	8,000	38,660
Shillington Boro	-	-	-	-	-	-	-	-	0
Shoemakersville Boro	12,100	235	-	29,091	-	-	-	11,000	52,426
Sinking Spring Boro	-	-	-	-	-	-	-	-	0
South Heidelberg Twp	1,849	-	649	-	-	-	-	800	3,298
Spring Twp	31,000	7,855	668	60,444	24,556	-	1,000	34,000	159,523
Tulpehocken Creek				60,444	-	-			
Cacoosing Creek				-	24,556	-			
Straustown Boro	-	-	-	-	-	-	-	-	0
Temple Boro	14,105	2,105	5,000	135,631	208,680	5,350	-	100,000	470,871
Tilden Twp	4,800	100	12,227	-	-	-	2,000	5,000	24,127
Tulpehocken Twp	500	-	-	-	-	-	-	200	700
Union Twp	5,600	19,570	53,007	393,605	64,700	379,855	4,000	250,000	1,170,337
Upper Bern Twp	1,000	500	4,628	-	-	-	-	1,500	7,628
Upper Tulpehocken Twp	-	500	3,808	-	-	-	-	1,000	5,308
Washington Twp	-	100	18,050	-	-	-	-	5,000	23,150
Wernersville Boro	1,282	-	-	-	-	-	-	200	1,482

* This figure includes expenses incurred by school district in housing flood victims.

MUNICIPALITY WITH STREAMS	MUNICIPAL EXPENSES	OTHER GOVTL EXPENSES	HIGHWAY-RR -UTIL EXP.	RESIDENTIAL DAMAGES	COMM./INDL DAMAGES	SCHOOL EXPENSES	AGRICULTURE DAMAGES	EMERGENCY COSTS	TOTAL
West Lawn Boro	-	-	-	-	-	-	-	-	0
West Reading Boro	54,313	11,890	7,000	51,450	219,600	-	-	93,000	437,253
Schuylkill River				51,450	219,600				
Wyomissing Creek				-	-				
Windsor Twp	-	6,250	5,205	-	-	-	-	3,000	14,455
Wömeledorf Boro	-	-	-	-	-	-	-	-	0
Wyomissing Boro	20,882	1,390	4,000	3,440	216,370	-	-	66,000	312,082
Tulpehocken Creek				-	200,455				
Wyomissing Creek				-	15,915				
Schuylkill River				3,440	-				
Wyomissing Hills Boro	-	-	-	-	-	-	-	-	0
Totals	2,410,709	319,996	4,473,462	8,961,080	23,060,630	717,988	122,500	10,830,800	50,897,165

CHESTER COUNTY COMPILATION SHEET

MUNICIPALITY WITH STREAM	MUNICIPAL EXPENSES	OTHER GOVTL EXPENSES	HIGHWAY-RR -UTIL EXP.	RESIDENTIAL DAMAGES	CONWL/INDL DAMAGES	SCHOOL EXPENSES	AGRICULTURE DAMAGES	EMERGENCY COSTS	TOTAL
Charlestown Twp	-	4,500	4,311	-	-	-	-	2,400	11,211
East Coventry Twp	8,211	501,000	76,940	155,920	96,930	-	11,000	228,000	1,078,001
East Nantmeal Twp	-	-	174	-	-	-	-	-	174
East Pikeland Twp	-	500	98,377	-	-	-	8,000	28,600	135,477
Easttown Twp	-	-	-	-	-	-	-	-	0
East Vincent Twp	4,069	56,801	14,503	-	-	-	6,000	21,700	103,073
East Whiteland Twp	521	-	3,429	-	-	-	-	1,000	4,950
Elverson Boro	-	-	-	-	-	-	-	-	0
Malvern Boro	-	-	-	-	-	-	-	-	0
North Coventry Twp	140,612	11,411	70,996	2,633,000	1,268,904	-	9,000	1,106,500	5,240,423
Phoenixville Boro	274,333	1,000	49,012	70,541	4,079,818	-	-	1,200,000	5,674,704
Schuylkill River	240,000	-	34,012	6,660	222,077	-	-	-	-
French Creek	34,333	-	15,000	63,881	3,857,741	-	-	-	-
Schuylkill Twp	2,330	1,000	40,077	13,900	1,011,000	-	13,000	290,000	1,371,307
South Coventry Twp	20,000	-	5,758	-	-	-	2,000	7,500	35,258
Spring City Boro	19,150	1,000	51,189	55,880	2,164,651	-	-	614,000	2,905,870
Tredyffrin Twp	-	-	-	-	-	-	-	-	0
Upper Uwchian Twp	150	-	-	-	-	-	-	-	150
Uwchian Twp	750	-	-	-	-	-	-	200	950
Warwick Twp	-	300	4,821	-	-	-	-	1,300	6,421
West Nantmeal Twp	-	-	-	-	-	-	-	-	0
West Pikeland Twp	3,525	-	882	-	-	-	-	1,200	5,607
West Vincent Twp	2,552	-	9,889	-	-	-	1,000	3,700	17,141
West Whiteland Twp	-	-	-	-	-	-	-	-	0
Willistown Twp	-	-	-	-	-	-	-	-	0
Totals	476,203	577,512	430,358	2,929,241	8,621,303	0	50,000	3,506,100	16,590,717

MONTGOMERY COUNTY COMPILATION SHEET

MUNICIPALITY WITH STREAMS	MUNICIPAL EXPENSES	OTHER GOVTL EXPENSES	HIGHWAY-RR -UTIL EXP.	RESIDENTIAL DAMAGES	COMML/INDL DAMAGES	SCHOOL EXPENSES	AGRICULTURE DAMAGES	EMERGENCY COSTS	TOTAL
Abington Twp	-	-	-	-	-	-	-	-	0
Ambler Boro	-	-	-	-	-	-	-	-	0
Bridgeport Boro	40,854	9,865	46,114	347,345	1,169,649	-	-	435,000	2,048,827
Cheltenham Twp	-	-	-	-	-	-	-	-	0
Collegeville Boro	101,800	4,150	6,000	440,050	127,183	-	-	183,000	862,183
Conshohocken Boro	108,414	23,010	44,234	60,020	3,528,845	1,220*	-	1,014,000	4,779,743
Douglass Twp	3,830	25	-	-	-	-	-	1,000	4,855
East Greenville Boro	3,114	20	-	-	-	-	-	700	3,834
East Norriton Twp	2,000	155	-	-	-	-	-	500	2,655
Franconia Twp	-	-	-	-	-	-	-	-	0
Green Lane Boro	5,120	250	5,508	21,808	8,800	-	-	11,000	52,486
Hatfield Twp	-	-	-	-	-	-	-	-	0
Lansdale Boro	-	-	-	-	-	-	-	-	0
Limerick Twp	9,300	5,615	43,419	35,533	-	-	500	25,000	119,367
Lower Frederick Twp	66,000	1,240	12,520	-	124,050	-	1,000	55,000	259,810
Lower Gwynedd Twp	-	-	-	-	-	-	-	-	0
Lower Merion Twp	16,195	3,670	17,672	512,670	51,450	-	-	162,000	763,657
Lower Pottsgrove Twp	39,710	1,001,430	62,579	-	118,944	12,052**	-	333,000	1,567,715
Lower Providence Twp	8,000	1,185	8,236	153,108	22,890	500*	1,000	52,500	247,419
Schuylkill River	-	-	-	96,860	-	-	-	-	-
Perkiomen Creek	-	-	-	56,248	22,890	500	-	-	-
Lower Salford Twp	-	-	-	-	-	-	-	-	0
Marlborough Twp	800	355	31,737	21,429	-	-	-	15,000	69,321
Unami Creek	-	-	-	13,044	-	-	-	-	-
Macoby Creek	-	-	-	8,385	-	-	-	-	-
Montgomery Twp	-	-	-	-	-	-	-	-	0

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* This figure includes expenses incurred by school district in housing flood victims.

** \$11,420 for band uniforms lost when dry cleaning establishment was flooded; \$632 incurred by school district in housing flood victims.

MUNICIPALITY WITH STREAMS	MUNICIPAL EXPENSES	OTHER GOVTL EXPENSES	HIGHWAY-RR -UTIL EXP.	RESIDENTIAL DAMAGES	COMM/INDL DAMAGES	SCHOOL EXPENSES	AGRICULTURE DAMAGES	EMERGENCY COSTS	TOTAL
Narberth Boro	-	-	-	-	-	-	-	-	0
New Hanover Twp	25,201	155	-	-	-	-	-	6,500	31,856
Norristown Boro	216,394	69,352	761,934	132,045	4,082,974	-	-	1,417,000	6,679,699
North Wales Boro	-	-	-	-	-	-	-	-	0
Pennsburg Boro	-	-	-	-	-	-	-	-	0
Perkiomen Twp	-	1,160	6,118	159,935	33,324	-	1,000	54,000	255,537
Plymouth Twp	79,600	1,225	9,000	8,460	101,890	-	-	54,000	254,175
Pottstown Boro	556,790	576,723	1,081,517	1,581,730	12,718,082	51,470	-	4,463,000	21,029,312
Schuylkill River	469,540	-	-	607,985	11,542,416	-	-	-	-
Manatawny Creek	87,250	-	-	973,745	1,175,666	51,470	-	-	-
Red Hill Boro	-	-	-	-	-	-	-	-	0
Royersford Boro	56,910	22,220	62,761	-	3,493,741	208*	-	980,000	4,615,840
Salford Twp	-	-	-	-	-	-	-	-	0
Schwenksville Boro	2,450	205	9,673	77,705	13,400	-	-	9,000	42,433
Skippack Twp	4,000	22,760	4,763	277,255	-	-	1,500	83,000	393,278
Souderton Boro	-	-	-	-	-	-	-	-	0
Springfield Twp	-	-	-	-	-	-	-	-	0
Telford Twp	-	-	-	-	-	-	-	-	0
Towamencin Twp	-	-	-	-	-	-	-	-	0
Trappe Boro	10,000	601	-	-	-	-	-	2,600	12,660
Upper Dublin Twp	2,044	15	-	-	-	-	-	500	2,559
Upper Frederick Twp	-	10	2,290	-	-	-	-	500	2,800
Upper Gwynedd Twp	-	-	-	-	-	-	-	-	0
Upper Hanover Twp	-	20	3,403	-	-	-	-	700	4,123
Upper Merion Twp	36,066	3,765	79,835	-	495,210	900*	-	166,000	781,776
Upper Pottsgrove Twp	4,875	55	4,000	-	-	-	-	2,300	11,230

* This figure includes expenses incurred by school district in housing flood victims.

MUNICIPALITY WITH STREAMS	MUNICIPAL EXPENSES	OTHER GOVTL EXPENSES	HIGHWAY-RR -UTIL EXP.	RESIDENTIAL DAMAGES	COMM/INDL DAMAGES	SCHOOL EXPENSES	AGRICULTURE DAMAGES	EMERGENCY COSTS	TOTAL
Upper Providence Twp Schuylkill River Perkiomen Creek Mingo Creek	109,855	60,225	43,285	1,418,804 1,316,021 87,978 14,805	2,812,151 2,808,221 3,930 -	1,069*	2,500	1,200,000	5,647,889
Upper Salford Twp Perkiomen Creek Unami Creek	100	290	10,395	41,001 36,322 4,679	-	-	-	14,000	65,786
West Conshohocken Boro	2,000	5,160	49,706	-	786,935	-	-	227,000	1,070,801
West Norriton Twp	7,597	7,465	9,768	450,348	770,079	-	-	335,000	1,580,257
West Pottsgrove Twp Schuylkill River Manatawny Creek	19,580	15,740	139,184	8,657 - 8,657	2,391,950 2,391,950 -	-	-	693,000	3,268,111
Whitemarsh Twp Schuylkill River Manor Creek Unnamed Creek	12,443	990	19,418	23,778 10,822 - 12,956	849,710 819,910 25,800 4,000	-	-	244,000	1,150,339
Whitpain Twp	19,230	115	-	-	-	-	-	5,000	24,345
Worcester Twp	-	10	2,500	-	-	-	-	700	3,210
Totald.	1,570,272	1,838,690	2,577,569	5,701,681	33,701,257	67,419	7,500	12,245,500	57,709,888

* This figure includes expenses incurred by school district in housing flood victims.

SCHUYLKILL COUNTY COMPILATION SHEET

MUNICIPALITY WITH STREAMS	MUNICIPAL EXPENSES	OTHER GOVTL EXPENSES	HIGHWAY-RR -UTIL EXP.	RESIDENTIAL DAMAGES	COMML/INDL DAMAGES	SCHOOL EXPENSES	AGRICULTURE DAMAGES	EMERGENCY COSTS	TOTAL
Auburn Boro	-	-	3,626	8,611	720,000	-	-	200,000	932,237
Bear Creek	-	-	-	8,611	-	-	-	-	-
Schuylkill River	-	-	-	-	720,000	-	-	-	-
Blyth Twp	62,183	-	44,730	20,010	9,716	-	-	37,000	173,639
Branch Twp	13,818	-	846	-	31,600	-	-	12,500	58,764
Butler Twp	7,850	-	-	-	-	-	-	2,200	10,050
Cass Twp	125,188	3,450	71,466	-	-	-	-	54,500	254,604
Coaldale Boro	-	-	11,337	-	-	-	-	3,000	14,337
Cressona Boro	4,978	-	-	-	-	-	-	1,300	6,278
Deer Lake Boro	-	-	320	-	-	-	-	-	320
Delano Twp	-	-	5,402	-	-	-	-	1,300	6,702
East Brunswick Twp	37,432	18,750	7,158	-	-	-	2,000	18,000	83,340
East Norwegian Twp	-	-	13,524	-	56,000	-	-	19,000	88,524
Foster Twp	30,598	-	68,612	-	-	-	-	27,000	126,210
Kline Twp	4,000	-	-	-	-	-	-	11,100	5,100
Landingville Boro	5,278	-	5,698	12,096	9,220	-	-	8,700	40,992
Schuylkill River	-	-	-	6,104	-	-	-	-	-
Mahannon Creek	-	-	-	5,992	9,220	-	-	-	-
McAdoo Boro	-	-	-	-	-	-	-	-	0
Mahanoy Twp	-	-	363	-	-	-	-	-	363
Mechanicsville Boro	-	-	11,337	-	-	-	-	3,000	14,337
Middleport Boro	138,000	9,546	15,719	113,167	32,472	-	-	84,000	392,904
Schuylkill River	91,000	-	-	60,958	26,262	-	-	-	-
Kaska Creek	16,000	-	-	37,647	6,210	-	-	-	-
Morgan Creek	31,000	-	-	14,562	-	-	-	-	-
Minersville Boro	-	-	-	85,689	43,377	-	-	35,200	164,266
West Br. Schuylkill River	-	-	-	58,515	40,927	-	-	-	-
Norwegian Creek	-	-	-	1,826	-	-	-	-	-
Unnamed Creek	-	-	-	25,348	2,450	-	-	-	-

MUNICIPALITY WITH STREAMS	MUNICIPAL EXPENSES	OTHER GOVTL EXPENSES	HIGHWAY-RR -UTIL EXP.	RESIDENTIAL DAMAGES	COMM./INDL DAMAGES	SCHOOL EXPENSES	AGRICULTURE DAMAGES	EMERGENCY COSTS	TOTAL
Mt. Carbon Boro	-	-	-	2,794	20,000	-	-	6,300	29,094
New Castle Twp	32,877	-	6,183	-	-	-	-	10,600	49,660
New Philadelphia Boro	14,991	-	11,337	13,218	6,890	-	-	12,500	58,936
Schuylkill River	14,991	-	11,337	13,218	6,640	-	-	-	-
Yellow Creek	-	-	-	-	250	-	-	-	-
New Ringgold Boro	950	-	237	-	2,890	-	-	1,100	5,177
North Manheim Twp	7,668	-	22,999	-	-	-	-	8,500	39,167
Norwegian Twp	-	-	-	-	-	-	-	-	0
Orwigsburg Boro	31,342	-	22,837	24,938	-	-	-	21,500	100,617
Palo Alto Boro	-	-	1,801	-	-	-	-	500	2,301
Port Carbon Boro	14,936	6,359	13,737	428,915	497,141	-	-	262,000	1,223,088
Schuylkill River	-	-	-	82,540	137,933	-	-	-	-
Mill Creek	14,936	-	-	346,375	359,208	-	-	-	-
Port Clinton Boro	19,877	1,596	320	205,505	13,530	-	-	66,000	306,828
Schuylkill River	-	-	-	144,511	13,530	-	-	-	-
Little Schuylkill River	-	-	-	57,381	-	-	-	-	-
Rattling Run	-	-	-	3,613	-	-	-	-	-
Pottsville City	11,014	-	68,022	1,441	17,945	-	-	27,000	125,422
Norwegian Creek	-	-	-	1,441	17,305	-	-	-	-
West Br. Schuylkill River	-	-	-	-	640	-	-	-	-
Reilly Twp	4,565	-	-	4,481	1,060	-	-	2,700	12,806
Rush Twp	8,146	54,800	7,050	-	-	-	-	19,000	88,996
Ryan Twp	6,431	-	1,306	-	-	-	-	2,200	9,937
Saint Clair Boro	267,645	-	2,187	96,654	16,280	-	-	104,500	487,266
Schuylkill Haven Boro	38,042	-	-	323,300	861,201	1,077	-	334,000	1,557,620
Schuylkill Twp	350	-	23,292	-	-	-	-	6,500	30,142
South Manheim Twp	8,000	3,500	1,658	-	-	-	400	4,000	17,558
Tamasqua	21,390	-	22,674	93,552	575	-	6,240	39,500	183,931
Walker Twp	-	-	42,633	-	315,300	-	2,000	98,000	457,933
Wayne Twp	-	1,150	-	-	-	-	-	300	1,450
West Brunswick Twp	10,025	-	14,874	-	-	-	4,200	8,000	37,099
West Mahanoy Twp	-	-	604	-	-	-	-	300	904
West Penn Twp	19,033	-	7,078	-	-	-	1,000	7,400	34,511
Totals	946,607	99,151	530,967	1,434,371	2,655,197	1,077	15,840	1,550,200	7,233,410

COUNTY COMPILATION SHEET

MUNICIPALITY WITH STREAMS	MUNICIPAL EXPENSES	OTHER GOVTL EXPENSES	HIGHWAY-RR -UTIL EXP.	RESIDENTIAL DAMAGES	COMM/INDL DAMAGES	SCHOOL EXPENSES	AGRICULTURE DAMAGES	EMERGENCY COSTS	TOTAL
<u>BUCKS COUNTY</u>									
Bedminster Twp	-	-	-	-	-	-	-	-	0
Dublin Borough	-	-	-	-	-	-	-	-	0
East Rockhill Twp	-	-	-	-	-	-	-	-	0
Hilltown Twp	-	-	-	-	-	-	-	-	0
Milford Twp	-	-	-	-	-	-	-	-	0
Perkasie Borough	7,320	-	-	-	-	-	-	2,000	9,320
Sellersville Borough	-	-	-	-	-	-	-	-	0
Silverdale Borough	-	-	-	-	-	-	-	-	0
Springfield Twp	-	-	-	-	-	-	-	-	0
Trumbauersville Borough	-	-	-	-	-	-	-	-	0
West Rockhill Twp	-	-	-	-	-	-	-	-	0
Totals	7,320	0	0	0	0	0	0	2,000	9,320
<u>LEBANON COUNTY</u>									
Heidelberg Twp	-	-	-	-	-	-	-	-	0
Jackson Twp	-	-	3,289	-	-	-	-	1,300	6,089
Millcreek Twp	1,035	-	15,777	3,825	-	-	1,500	5,900	28,037
Myerstown Borough	37,500	-	-	25,748	10,400	-	-	19,800	93,448
North Lebanon Twp	-	-	491	-	-	-	-	-	491
Totals	38,535	0	19,557	29,573	10,400	0	3,000	27,000	128,065
<u>LEHIGH COUNTY</u>									
Lower Milford Twp	6,340	-	30,030	-	-	-	400	9,780	46,550
Lynn Twp	9,580	-	8,205	-	-	-	800	5,030	23,615
Upper Milford Twp	58,000	-	1,666	-	-	-	400	15,870	75,936
Weisenberg Twp	2,000	-	2,472	-	-	-	400	1,320	6,192
Totals	75,920	0	42,373	0	0	0	2,000	32,000	152,293
<u>PHILADELPHIA COUNTY (TOTAL)</u>									
Schuylkill River	1,172,810	0	212,594	289,718	5,040,659	0	0	1,809,600	8,564,779
Wissahickon Creek	39,398	-	-	289,718	5,040,659	-	-	-	-



GILBERT ASSOCIATES, INC.

ENGINEERS AND CONSULTANTS

INTANGIBLE DAMAGES DUE TO WATER AND SEWAGE SYSTEMS AFFECTED

NORRISTOWN

During the flood emergency, the public water supply was put out of service due to flooding. The sewage treatment plant was also out of commission. As a result, industries were ordered to close for about four days. As of September 1, 1972, 9,500 persons had paid the occupational head tax.

As of 6-22-72, assume	9,300
less those working for flooded companies	<u>-1,000</u>
Net affected employees	8,300
Assume only 60% affected by shut down	<u>x 60%</u>
Number of employees 'closed out' of jobs	4,980
Figure average time closed - 4 days @ salary of \$30/man-day	<u>x \$120</u>
Lost Salaries	\$597,600
Figure lost profits and fixed expenses at double the lost salaries	<u>x 2</u>
<u>TOTAL INTANGIBLES</u>	<u>\$1,195,200</u>

READING

During the flood emergency, the water and sewage systems were likewise affected and industries were ordered to close, as were commercial entities, for an average of 3 days. As of 11-6-72, 52,570 persons had paid the occupational head tax to the City.

As of 6-22-72, assume	50,000
less those working for flooded companies	<u>-5,000</u>
Net affected employees	45,000
Assume only 60% affected by shut down	<u>x 60%</u>
Number of employees 'closed out' of jobs	27,000
Figure average time closed - 3days @ salary of \$30/man-day	<u>x \$90</u>
Lost Salaries	\$2,430,000
Figure lost profits and fixed expenses at double the lost salaries	<u>x 2</u>
<u>TOTAL INTAGIBLES</u>	<u>\$4,860,000</u>



GILBERT ASSOCIATES, INC.

ENGINEERS AND CONSULTANTS

INTANGIBLE DAMAGES DUE TO WATER AND SEWAGE
SYSTEMS AFFECTED

POTTSTOWN AREA

During the flood emergency, the public water supply was un-potable. The use of water was limited to urgent needs - a ban was placed on industrial uses etc. Industries were ordered closed during the emergency period for approximately 7 working days in Pottstown, West Pottsgrove Township, Lower Pottsgrove Township.

Pottstown

Twenty industries (excluding those damaged by flooding) were closed down, affecting 2,667 employees:

$$2,667 \times 7 \text{ days} \times \$30 \text{ per man day} = \$560,000$$

Figure lost profits and fixed
expenses at double the lost
salaries

	x 2
<u>TOTAL INTANGIBLES</u>	<u>\$1,120,000</u>

West Pottsgrove Township

Three industries were closed down, affecting 164 employees:

$$164 \times 7 \text{ days} \times \$30 = \$34,440$$

Lost profits, etc.

	x 2
<u>TOTAL INTANGIBLES</u>	<u>\$69,000</u>

Lower Pottsgrove Township

One industry was closed down, affecting 156 employees:

$$156 \times 7 \text{ days} \times \$30 = \$32,760$$

Lost profits, etc.

	x 2
<u>TOTAL INTANGIBLES</u>	<u>\$65,500</u>

SCHUYLKILL RIVER REACHES

<u>FROM</u>	<u>TO AND INCLUDING</u>	<u>SCHUYLKILL REACH NO.</u>
Mouth of Delaware River	Wissahickon Creek	I
Wissahickon Creek	Conshohocken	II
Conshohocken	Norristown (Stony Creek)	III
Norristown	Perkiomen Creek	IV
Perkiomen Creek	Phoenixville (French Creek)	V
Phoenixville	Spring City/Royersford	VI
Spring City/Royersford	Pottstown (Manatawny Creek)	VII
Pottstown	Birdsboro	VIII
Birdsboro	Reading (Tulpehocken Creek)	IX
Reading	Maiden Creek	X
Maiden Creek	Hamburg	XI
Hamburg	Little Schuylkill River	XII
Little Schuylkill River	West Branch Schuylkill	XIII
West Branch Schuylkill	Pottsville	XIV
Pottsville	The Upper Reaches	XV